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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/800,027

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Brant Duke

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EXAMINER

DEB, ANJAN K

ART UNIT

PAPER NUMBER

2858

DATE MAILED: 02/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/800,027

Applicant(s)

DUKE, BRANT

Examiner

Anjan K. Deb

Art Unit

2858

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment filed on 01/05/2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 5-7, 10-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Smith (U.S. Patent No. 4, 733, 155).

Referring to claim 1, Smith discloses a method for determining gas turbine engine (11) shaft (15) speed connected to an alternator (16, 18), adapted to generate electricity for a first purpose, comprising receiving alternator rotation frequency signal (frequency of the output from the alternator) and determining gas turbine shaft speed using said signal (column 2, lines 21-22).

Referring to claims 2, 7, 10 Smith discloses that the signal is derived from said generated electricity (from alternator 16 in Figure 1) and the method and apparatus further comprises a signal conditioning unit (pulse shaper 30 in Figure 2) for conditioning said signal to extract a rotational frequency component therefrom.

Referring to claim 5, Smith discloses that a voltage (output from alternator 16) is used to determine the rotation frequency component (column 2 lines 22-23).

Referring to claim 6, Smith discloses apparatus for determining a speed of a turbine shaft (15) of a gas turbine engine (11), said apparatus comprising input means (input to 32) for

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receiving a rotation signal from an alternator (16,18) driven by the turbine shaft (column 2, lines 21-22), the alternator adapted to generate electricity for a first purpose, and a processing unit (control circuit) (24) (Fig. 1 and 2) for determining said gas turbine shaft speed using said signal (amplifier 47 indicates that the desired and sensed speeds are equal)(column 2 lines 22-23) (Fig. 2).

Referring to claim 11, Smith discloses (in Figure 1) a method of operating a gas turbine engine (11), the engine having a turbine shaft (15) drivingly connected to a permanent magnet alternator (PMA 16), the method comprising the steps of operating the engine (11) to rotate the turbine shaft and thereby rotate the alternator (16) extracting generated electricity from the alternator (15) to thereby provide operational electrical power to at least a first piece of equipment (24 or 20), extracting from the generated electricity a frequency (frequency of the output from the alternator 16) (column 2, lines 21-23) indicative of alternator rotation speed, determining a rotation speed of the turbine shaft (15) using said frequency (control circuit 24 receives the frequency signal from the alternator and determines a over-speed condition of the shaft and provides a speed error signal)(column 2, lines 21-27 and lines 51-66), and providing the determined rotation speed to an engine controller (the drive device 20) for use in controlling operation of the gas turbine engine (11).

Referring to claim 12, Smith discloses that the first piece of equipment is the engine controller (20, 24).

Referring to claim 13, Smith discloses that the frequency is a voltage frequency (output from 32 is a voltage signal indicative of the frequency of the alternator)(column 2, lines 31-34).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3-4 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (US 4,733, 155), in view of Wakao et al. (US 6,035,960).

Referring to claims 3-4 and 8-9, Smith discloses the method/apparatus of claims 1 and 6. Smith does not specifically disclose determining the gas turbine shaft speed using a gearing ratio between the gas turbine and alternator shafts and a ratio of alternator generated electrical signal cycles per revolution of the alternator. Wakao et al. discloses calculating engine speed using a gearing ratio (pulley ratio) and a ratio of alternator generated electrical signal cycles per revolution of the alternator (pulsation coefficient) (column 3, line 64 to column 4, line 16).

At the time the invention was made it would have been obvious for a person of ordinary skill in the art to modify Smith by adding a calculation of gas turbine shaft speed using the equation containing the gearing ratio and the ratio of alternator generated electrical signal cycles per revolution of the alternator, as taught by Wakao, in order to obtain the shaft speed for controlling and maintaining gas turbine engine speed at a specified constant speed.

Response to Arguments

5. In response to applicants argument regarding rejection under *35 USC § 102* of claim 1-2, 5-7 and 10-13 that Smith does not determine (re claim 1) the gas turbine shaft speed and that the signal from the alternator is not related to the gas turbine shaft speed, applicant is kindly referred to Smith's disclosure (column 2 lines 21-22) wherein it is stated that the frequency of the output from the alternator 16 corresponds to the speed of the shaft 15.

In response to applicant's argument regarding rejecting of independent claim 6, that Smith does not show a processing unit for determining gas turbine shaft speed, applicant is kindly referred to Smith's disclosure (column 2 lines 22-23) wherein it is stated that a control unit (24) (Fig. 1 and 2) is used for determining gas turbine shaft speed using said signal (amplifier 47 indicates that the desired and sensed speeds are equal). The control unit 24 has been broadly interpreted as a processing unit which includes an amplifier 47 for indicating that sensed speeds are equal to desired speed.

In response to applicant's argument regarding rejection of independent claim 11, that Smith does not determine a rotation speed of the turbine shaft nor does it provide a determined rotation speed to an engine controller, and signal from the generator is not related to the gas turbine shaft speed, applicant is kindly referred to Smith's disclosure (column 2 lines 21-22) wherein it is stated that the frequency of the output from the alternator 16 corresponds to the speed of the shaft 15. In response to applicant's arguments that Smith does not provide a

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determined rotation speed to an engine controller, applicant is kindly referred to Smith's disclosure (column 2 lines 24-27) wherein it is stated the speed signal is supplied on a line 23 to a control circuit 24 which provides a speed error signal on a line 25 to the drive device 20 for controlling engine speed (Fig. 1).

In response to applicants argument regarding rejection under *35 USC § 103* of claim 3-4, 5-7 and 8-9 that Smith in view of Wakao (US 6,035,960) does not disclose the claimed limitations and there is no motivation to combine the references and that neither Wakao nor Smith determines a gas turbine shaft speed, that Smith uses a signal from the generator to control the generator speed, which is not related to the gas turbine shaft speed and Wakao does not show or use a gas turbine engine and there is thus no turbine shaft speed to determine and there is no need for a motorized power steering control in a vehicle that uses a gas turbine engine for instance, an aircraft.

Regarding neither Wakao nor Smith determines a gas turbine shaft speed applicant is kindly referred to Smith's disclosure (column 2 lines 21-22) wherein it is stated that the frequency of the output from the alternator 16 corresponds to the speed of the shaft 15 thus Smith clearly discloses determining gas turbine shaft speed.

Regarding there is no motivation to combine the references, the Wakao reference was used to provide a teaching of using a gearing ratio between engine and alternator shafts and a ratio of alternator generated electrical signal cycles per revolution of the alternator as is commonly used for measuring speed. Therefore, it would have been obvious for one of ordinary skill in the art to modify Smith by adapting the equation containing gear ratio and the ratio of

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alternator generated electrical signal cycles per revolution of alternator as taught by Wakao to calculate gas turbine shaft speed since both of these references are in the same field of endeavor of measuring engine speed.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Smith (US 3,662,252) discloses tachometer comprising an alternator (93) for determining shaft (92) speed (column 9, lines 2-10)(Fig. 8).

Applicant's arguments regarding rejection of claims 1-13 have been considered but are not persuasive for the reasons given above. Accordingly, **THIS ACTION IS MADE FINAL**. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Anjan K. Deb whose telephone number is 571-272-2228. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached at 571-272-2399.



Anjan K. Deb, PhD, PE (Electrical)

Primary Patent Examiner

Art Unit: 2858

2/1/06

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